

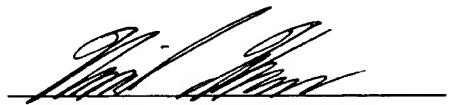
submitted specification and claims, and clean versions thereof to reflect there current form.

Applicant represents that this substitute specification does not add any new matter to the present application. It is believed that no new filing fees are necessitated by this Amendment. However, the Commissioner is hereby authorized to charge any deficiency in the payment of required fee(s) or credit any overpayment to Deposit Account No. 13-1940.

If the Examiner has any questions concerning this Preliminary Amendment, it is respectfully requested that the Examiner contact the undersigned representative for the Applicant.

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CERIFICATE OF MAILING UNDER 37 C.F.R. 1.8

I hereby certify that the foregoing **PRELIMINARY AMENDMENT** is being deposited with United States Postal Service as first class mail for delivery in a postage pre-paid envelope addressed to The Assistant Commissioner of Patents and Trademarks, Washington, D.C. 20231, on this 5th day of December, 2001.



Jacklyn K. Burns



A METHOD AND AN APPARATUS FOR STEREOPROJECTION OF PICTURES

FIELD OF THE INVENTION

- 5 The invention relates to a method and a device for stereoprojection of pictures.

BACKGROUND OF THE INVENTION

Our depth sight is connected with the fact that the right and left eye ~~sees~~eyes see the surroundings from a different place
10 and under a somewhat different angel. One eye sees a picture differing from the picture that the other eye sees, and the brain co-ordinates the two such that we experience three dimensions.

It is known to create pictures with a three-dimensional
15 effect by letting each right and left eye see a picture of its own, e.g. two photos taken from two points spaced correspondingly to a normal mutual distance between the eyes of a human being. There exist special cameras for such purposes, so-called stereo cameras, having two objectives.

20 In recent years, techniques used in order to achieve three-dimensional effect in photos, developed to comprise pictures that can be transferred electronically, such as video and

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digitized images, and ~~it~~ a technique has been developed
~~technique~~ that makes it possible to show both still pictures
and moving pictures on screen.

To let a viewer experience three-dimensional effect, the
5 picture photographed or made in some other way for the right
eye must be shown for the right eye, and the picture
photographed or made in some other way for the left eye, must
be shown for the left eye. If both pictures are shown for
both eyes, a blurred (unsharp) picture is experienced, and
10 the three-dimensional effect fails.

In order to avoid ~~that the~~ right eye ~~sees~~ seeing the picture
belonging to left eye, and vice versa, the pictures may be
viewed through an ocular for each eye, in a so-called
stereoscope. This gives a good three-dimensional effect, but
15 it is not very suited for pictures to be viewed by several
persons simultaneously, e.g. in a cinema hall.

It is known to divide a right and left picture in narrow
stripes which are assembled alternately to form one
picture. When viewing the picture stripes through glass or
20 plastic, where prisms are formed parallel to the pictures
stripes, ~~it is achieved~~ the result is that the right eye sees
picture stripes belonging to right picture, and that the left
eye sees picture stripes belonging to left picture.

Further, it is known to print two pictures, one for the right
25 eye and one for the left eye in registry on paper. Such
pictures are viewed through special spectacles separating the
pictures from each other, so that the right eye sees one
picture and the left eye sees the other picture.

In one type of spectacles, spectacle glasses having different ~~colour-color~~ for each eye ~~is-are~~ used, as ~~an example~~ such as a red and a bluish green. Each picture is prefiltered before printing. ~~Right-~~ The right picture is printed in complementary ~~colour-color~~ to the left picture and left spectacle glass, and vice versa. Then, each eye sees a different picture. The technique is also used when projecting two pictures in registry on a screen (canvas), and it is possible to show moving pictures, film and animations in this way.

- 10 The technique which also may be used for television, has several disadvantages. The filtration and the spectacle glasses influence the ~~colour-color~~ balance, and ~~it is not achieved~~ an adequate separation of the pictures for right and left eye is not achieved. Each eye experiences a portion of
 15 the picture meant for the opposite eye and the picture is, thus, experienced as unsharp.

Another known way of separating pictures for the right and left ~~eye-eyes~~ consists in that a picture for each eye is projected in registry on a screen by means of polarized
 20 light. The polarization for the one picture is at right angles ~~on-to~~ the polarization for the other, and the viewer uses spectacles having glasses each correspondingly being polarized for letting through light for one of the pictures only. By means of this, less ~~colour-color~~ error is achieved
 25 than by using ~~colour-a color~~ filter, and a better picture separation is obtained.

Upon transfer of electronic pictures, such as video pictures, it has been found to be difficult to synchronize two parallel picture signals in a flickerfree way. In connection with
 30 projecting video pictures or pictures from computers, it has proved advantageous to transfer picture for alternate right

and left eye in a common channel in lieu of in two parallel channels. This means that every second picture transferred, belongs to right eye, while the rest belongs to left eye. The pictures are projected on a screen and are viewed through
 5 spectacles having glasses which can shut and open in step with an electric signal alternating synchronously with the pictures. Such spectacle glasses utilize liquid crystals.
~~Left-~~The left spectacle glass is shut while the right picture is projected, and the right spectacle glass is shut while
 10 the left picture is projected.

This known technique gives a good effect, but it has several disadvantages. The spectacles are expensive, and they have to be provided with an electric signal for synchronization with the stream of pictures, which can be difficult in a cinema
 15 hall. In practice, the technique is usable only for stationary plants. Also, great demands are made upon the projector which has to operate with double picture frequency. The high picture rate ~~involves~~-means that reasonable projectors in which the picture is formed by ~~means of~~ liquid
 20 crystals, can not be used.

SUMMARY OF THE INVENTION

The object of the invention is to provide a method and a simplified device in order to achieve stereo projection of pictures represented by a picture signal which cyclically
 25 alternates between picture for the right and the left eyeeyes.

The object is obtained by means of features as defined in the following description and the following claims.

According to the invention, a picture signal is received
 30 which in known manner alternates between a picture for the right and left eyeeyes.

~~First~~ The first picture received in incoming picture signal, is decoded and, possibly, digitized into a first digital picture which is stored in a first digital storage device, typically a cache memory in a computer. ~~First~~ The first
 5 digital storage device is searched as known, and from the content is formed an outgoing first picture signal. ~~Second~~
The second picture received in incoming picture signal, is decoded and digitized correspondingly to the first picture, and is stored in a second digital storage device. ~~Second~~ The
 10 second digital storage device is searched, and from the content is formed a second outgoing picture signal. Following pictures received in incoming picture signal are, thereupon, stored alternately in the first and second digital storage deviceedevices.

 15 ~~First~~ The first outgoing picture signal is passed to a first projector, and the second outgoing picture signal is passed to a second projector. Even if the incoming picture signal has double picture rate, each projector operates with a normal picture rate, so that ordinary projectors can ~~b-be~~
 20 used.

Each of said first and second digital storage device may advantageously be divided into two or more areas used cyclically. Thus, a third picture can be received, decoded, digitized and stored separately from the first picture and
 25 without overwriting the same. ~~Fifth~~ A fifth picture may be stored at the same place as first picture and overwrite the same, while the third picture is intact and may be projected during receipt and storing of the fifth picture.

Correspondingly, a fourth picture can be received, decoded,
 30 digitized and stored separately from the second picture, without overwriting the same. ~~Sixth~~ A sixth picture can be stored at the

same place as the second picture and overwrite the same while the fourth picture is projected.

With such a division and cyclic use of first and second digital storage ~~device~~devices, great tolerance in respect of
5 the picture rate in incoming picture signal is achieved. This is a great advantage when the picture signals are transferred through a data network where the transfer speed may vary greatly, and where picture data may get lost.

The picture from one projector is projected such that it can
10 be viewed by one eye, and the picture from the other projector is projected such that it can be viewed by the other eye. In a preferred arrangement, a picture from first and second ~~projector~~projectors is projected in registry on a screen by means of polarized light, and the pictures are
15 viewed through spectacles having polarized glass, such as explained.

By means of the invention is achieved that each and every projected picture can be renewed in a cycle that only depends on the frequency with which the digital storage devices are
20 scanned. Even if this may involve that the same picture is shown several times if the incoming picture rate descends, a substantial reduction of flicker is obtained as compared with a known technique where picture projection follows the incoming picture rate.

25 A device for carrying out the described method is described in the following by means of two exemplary embodiments, and reference is made to attached drawings, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a simplified block scheme for a first
30 embodiment of the invention;

Figure 2 shows a simplified block scheme for a second embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In figure 1, the reference numeral 1 denotes a right
5 projector adapted to project a picture to be seen by the
right eye, in registry with a projected picture from a
corresponding, left projector 2 projecting a picture to be
seen by the left eye.

Right projector 1 is coupled to and receives its picture
10 signal from a right picture generator 3. Left projector 2 is
coupled correspondingly to a left picture generator 4. Each
picture generator 3, 4 is adapted to scan a picture storage
and generate a picture signal causing the projector 1, 2
belonging thereto, to project a visible picture belonging
15 thereto, on a screen.

Right picture generator 3 is adapted to scan periodically an
area within a right picture storage 5, and left picture
generator 4 is correspondingly adapted to scan periodically
an area within a left picture storage 6. Right picture
20 storage 5 is divided into a first right picture area 7 and a
second right picture area 8. Left picture storage 6 is
correspondingly divided into a first left picture area 9 and
a second left picture area 10.

A right picture selector 11 is adapted to react on a control
25 signal and connects, alternately, right picture generator 3
to first or second picture area 7, 8 in right picture storage
5 and, thus, determines if right projector 1 projects a
picture based on first or second picture area 7, 8. A left
picture selector 12 is, correspondingly, adapted to react on
30 a control signal, alternately connecting left picture

generator 4 to first or second picture area 9, 10 in left picture storage 6, thus determining if left projector 2 projects a picture based on first or second picture area 9, 10.

5 A right decoder 13 is adapted to receive a picture signal and store values representing the picture signal, in right picture storage 5 on a format which right picture generator 3 is adapted to convert to picture signals for right projector 1. A left decoder 14 is, correspondingly, adapted to receive
10 a picture signal and store values representing the picture signal, in left picture storage 6 on a format which left picture generator 4 is adapted to convert into picture signals for left projector 2.

Between right decoder 13 and right picture storage 5, is
15 disposed a right area selector 15 adapted to respond to a control signal, alternately connecting the decoder 13 to second or first picture area 8, 7 in right picture storage 5 and, thus, determine whether the decoder 13 stores values in second or first picture area 8, 7. Right picture selector 11
20 and right area selector 15 alternate such that right picture generator 3 and right decoder 13 are coupled to opposite picture area 7, 8 in right picture storage 5. Intermediate left decoder 14 and left picture storage 6 is, correspondingly, disposed a left area selector 16 adapted to
25 respond to a control signal, alternately connecting the decoder 14 to second or first picture area 10, 9 in left picture storage 6 and, thus, determine whether the decoder 14 is storing values in second or first picture area 10, 9. Left picture selector 12 and left area selector 16 alternate such
30 that left picture generator 4 and left decoder 14 are coupled to opposite picture area 9, 10 in left picture storage 6.

A page selector 17 is adapted to respond to control signals and alternately connect a conductor 18 for an incoming picture signal to right decoder 13 or left decoder 14.

5 A controller 19 is adapted to sense the incoming picture signal and recognize signal values or signal codes defining a new picture and giving switching signals to the page selector 17 for each picture. Right decoder 13 is adapted to give a switching signal to right area selector 15 and right picture selector 11 each and every time the decoder has stored a new
10 picture in right picture storage 5. Left decoder 14 is adapted to give a switching signal to left area selector 16 and left picture selector 12 each and every time the decoder has stored a new picture in right picture storage 6.

Each picture generator 3, 4 feeds a new picture,
15 respectively, to right or left, ~~respectively,~~ projector 1, 2, following a fixed picture rate, e.g. sixty times per second, even if the incoming picture rate varies. In lack of new picture information, the picture generators 3, 4 will repeat last picture.

20 The right picture selector may alternate while the right picture generator 3 is ~~about~~ in the process of transferring picture signals to the projector 1. Advantageously, the picture generator 3 may be formed with internal storage, not shown, having a capacity for one picture, only scanning right
25 picture storage 5 each time it has completed the transfer of one picture to right projector 1. Thus, a projected picture consisting of parts from two pictures is avoided. Correspondingly, left picture selector 12 may come to alternate while left picture generator 4 is in the course of
30 transferring picture signals to the projector 2. Advantageously, the picture generator 4 may also be formed with internal storage, not shown, having a

capacity for one picture, only scanning left picture storage 6 each and every time it has completed to transfer a picture to left projector 2. Thus, a projected picture consisting of parts from two pictures is avoided.

5 A second and preferred embodiment of the invention is shown in figure 2, where the projectors 1, 2 are connected to a common picture storage 20 through a picture 11 selector and 12 of their own, respectively. Possible picture generator for each of the projectors 1, 2 is not shown, but it may be
 10 disposed correspondingly to the described one. The picture storage 20 is divided into four picture areas 21, 22, 23, 24. A controller 25 is adapted to read and store a picture signal in the conductor 18 ~~in the picture storage 20~~ into one of the picture areas 21, 22, 23, 24 of picture storage 20 through an
 15 area selector 26. Pictures are stored in consecutive succession, so that first picture is stored in picture area 21, the next in 22 and so forth until all picture areas have been used. ~~Next~~ The next picture is stored in 21, and the process repeats itself, the picture storage 20 being
 20 organized as a ring buffer.

Through its picture selector 11, projector 1 reads a picture stored in picture area 21 or 23. Through its picture selector 12, projector 2 reads a picture stored in picture area 22 or 24. Thus, each projector 1, 2 reads every second picture from
 25 the picture storage 20.

The alternating cycle for the picture selectors 11 and 12 is adjusted such that the gathered projected picture becomes as free of flicker as possible. The picture cycle at each projector 1, 2 may e.g. be equal to half of the cycle ~~in of~~
 30 the incoming pictures when it is lower ~~then~~ than one predetermined value and, thereupon, restricted to an upper picture cycle if the

incoming picture cycle increases beyond the same. Typically,
the incoming picture cycle should be lower than 85 pictures
per second ~~cause~~ causing a corresponding outgoing picture
cycle. Above this limit, e.g. outgoing picture cycle may be
5 halved.

Likewise, the picture cycle to each projector 1, 2 can be
restricted to a minimum value, so that a stable picture is
maintained at an incoming picture signal which has an
extremely low cycle.

10 Accordingly, the present invention has been described with
some degree of particularity directed to the preferred
embodiments of the present invention. It should be
appreciated, though, that the present invention is defined by
the following claims construed in light of the prior art so
15 that modifications or changes may be made to the preferred
embodiments of the present invention without departing from
the inventive concepts contained herein.



Clean Version of Rewritten Claims Under 37 C.F.R.

§1.121(c)(1)(ii)

I Claim:

- A1
- 5
- 10
- 15
- 20
- 25
1. (Rewritten) In a method for stereo projection of pictures represented by a picture signal alternating cyclically between a intended for the right eye and a intended for the left eye, whereby first and, thereafter, each odd numbered picture received, is transferred to a first projector, and whereby second and, thereupon, each even numbered picture received, is transferred to second projector, c h a r a c t e r i z e d i n that picture signals for odd numbered pictures are decoded and stored in a first picture storage which is scanned periodically and projected by said first projector, and picture signals for even numbered pictures are decoded and stored in a second picture storage which is scanned periodically and projected by said second projector.
 2. (Rewritten) A device for stereo projection of pictures represented by a picture signal which alternates cyclically between a intended for the right eye and a intended for the left eye, c h a r a c t e r i z e d i n that said device comprises a page selector adapted to transmit picture signals for a first and, thereafter, each odd numbered picture to a first projector and to transmit picture signals for a second and, thereafter, each even numbered picture to a second projector, and that said page selector is assigned a control unit adapted to sense the incoming picture signal and.

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conc.

recognize signal values or signal codes indicating new pictures and to alternately transmit to said page selector for each picture.

Marked-up Version of Rewritten Claims Under 37 C.F.R.

§1.121(c)(1)(ii)

I Claim:

1. (Rewritten) In Aa method for stereo projection of
5 pictures represented by a picture signal alternating
cyclically between a picture-intended for the right eye
and a picture-intended for the left eye, and
whereinwhereby first and, thereuponthereafter, each odd
number-numbered picture received, is transferred to a
10 first projector-(1), and whereby second and, thereupon,
each even number-numbered picture received, is
transferred to second projector-(2), c h a r a c t e r
i z e d i n that picture signals for odd number
numbered pictures are decoded and stored in a first
15 picture storage (5)-which is scanned periodically and
projected by said first projector-(1), and that-picture
signals for even number-numbered pictures are decoded
and stored in a second picture storage (6)-which is
scanned periodically and projected by said second
20 projector-(2).
2. (Rewritten) A device for stereo projection of pictures
represented by a picture signal which alternates
cyclically between a picture-intended for the right eye
and a picture-intended for the left eye, c h a r a c t
25 e r i z e d i n that said device comprises a page
selector (17)-adapted to transmit picture signals for a
first and, thereuponthereafter, each odd number-numbered
picture to a first projector (1)-and to transmit picture
signals for a second and, thereuponthereafter, each even

~~number~~numbered picture to a second projector~~(2)~~, and
that said page selector ~~(17)~~ is assigned a control unit
~~(19)~~ adapted to sense the incoming picture signal and
recognize signal values or signal codes indicating new
5 ~~picture~~pictures and to ~~transmit~~transmit alternately
transmit to said page selector ~~(17)~~ for each picture.



A METHOD AND AN APPARATUS FOR STEREOPROJECTION OF PICTURES

FIELD OF THE INVENTION

- 5 The invention relates to a method and a device for stereoprojection of pictures.

BACKGROUND OF THE INVENTION

Our depth sight is connected with the fact that the right and left eyes see the surroundings from a different place and under a somewhat different angel. One eye sees a picture differing from the picture that the other eye sees, and the brain co-ordinates the two such that we experience three dimensions.

It is known to create pictures with a three-dimensional effect by letting each right and left eye see a picture of its own, e.g. two photos taken from two points spaced correspondingly to a normal mutual distance between the eyes of a human being. There exist special cameras for such purposes, so-called stereo cameras, having two objectives.

20 In recent years, techniques used in order to achieve three-dimensional effect in photos, developed to comprise pictures that can be transferred electronically, such as video and digitized images, and a technique has been developed that makes it possible to show both still pictures and moving pictures on screen.

To let a viewer experience three-dimensional effect, the picture photographed or made in some other way for the right eye must be shown for the right eye, and the picture photographed or made in some other way for the left eye, must be shown for the left eye. If both pictures are shown for

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both eyes, a blurred (unsharp) picture is experienced, and the three-dimensional effect fails.

In order to avoid the right eye seeing the picture belonging to left eye, and vice versa, the pictures may be viewed
5 through an ocular for each eye, in a so-called stereoscope. This gives a good three-dimensional effect, but it is not very suited for pictures to be viewed by several persons simultaneously, e.g. in a cinema hall.

It is known to divide a right and left picture in narrow
10 stripes which are assembled alternately to form one picture. When viewing the picture stripes through glass or plastic, where prisms are formed parallel to the pictures stripes, the result is that the right eye sees picture stripes belonging to right picture, and that the left eye
15 sees picture stripes belonging to left picture.

Further, it is known to print two pictures, one for the right eye and one for the left eye in registry on paper. Such pictures are viewed through special spectacles separating the pictures from each other, so that the right eye sees one
20 picture and the left eye sees the other picture.

In one type of spectacles, spectacle glasses having different color for each eye are used, such as a red and a bluish green. Each picture is prefiltered before printing. The right picture is printed in complementary color to the left picture
25 and left spectacle glass, and vice versa. Then, each eye sees a different picture. The technique is also used when projecting two pictures in registry on a screen (canvas), and it is possible to show moving pictures, film and animations in this way.

30 The technique which also may be used for television, has several disadvantages. The filtration and the spectacle glasses influence the color balance, and an adequate

separation of the pictures for right and left eye is not achieved. Each eye experiences a portion of the picture meant for the opposite eye and the picture is, thus, experienced as unsharp.

5 Another known way of separating pictures for the right and left eyes consists in that a picture for each eye is projected in registry on a screen by means of polarized light. The polarization for the one picture is at right angles to the polarization for the other, and the viewer uses
10 spectacles having glasses each correspondingly being polarized for letting through light for one of the pictures only. By means of this, less color error is achieved than by using a color filter, and a better picture separation is obtained.

15 Upon transfer of electronic pictures, such as video pictures, it has been found to be difficult to synchronize two parallel picture signals in a flickerfree way. In connection with projecting video pictures or pictures from computers, it has proved advantageous to transfer picture for alternate right
20 and left eye in a common channel in lieu of in two parallel channels. This means that every second picture transferred, belongs to right eye, while the rest belongs to left eye. The pictures are projected on a screen and are viewed through spectacles having glasses which can shut and open in step
25 with an electric signal alternating synchronously with the pictures. Such spectacle glasses utilize liquid crystals. The left spectacle glass is shut while the right picture is projected, and the right spectacle glass is shut while the left picture is projected.

30 This known technique gives a good effect, but it has several disadvantages. The spectacles are expensive, and they have to be provided with an electric signal for synchronization with the stream of pictures, which can be difficult in a cinema hall. In practice, the technique is usable only for
35 stationary plants. Also, great demands are made upon the

projector which has to operate with double picture frequency. The high picture rate means that reasonable projectors in which the picture is formed by liquid crystals, can not be used.

5

SUMMARY OF THE INVENTION

The object of the invention is to provide a method and a simplified device in order to achieve stereo projection of pictures represented by a picture signal which cyclically alternates between picture for the right and the left eyes.

- 10 The object is obtained by means of features as defined in the following description and the following claims.

According to the invention, a picture signal is received which in known manner alternates between a picture for the right and left eyes.

- 15 The first picture received in incoming picture signal, is decoded and, possibly, digitized into a first digital picture which is stored in a first digital storage device, typically a cache memory in a computer. The first digital storage device is searched as known, and from the content is formed
20 an outgoing first picture signal. The second picture received in incoming picture signal, is decoded and digitized correspondingly to the first picture, and is stored in a second digital storage device. The second digital storage device is searched, and from the content is formed a second
25 outgoing picture signal. Following pictures received in incoming picture signal are, thereupon, stored alternately in the first and second digital storage devices.

- The first outgoing picture signal is passed to a first projector, and the second outgoing picture signal is passed
30 to a second projector. Even if the incoming picture signal

has double picture rate, each projector operates with a normal picture rate, so that ordinary projectors can be used.

Each of said first and second digital storage device may advantageously be divided into two or more areas used
5 cyclically. Thus, a third picture can be received, decoded, digitized and stored separately from the first picture and without overwriting the same. A fifth picture may be stored at the same place as first picture and overwrite the same, while the third picture is intact and may be projected during
10 receipt and storing of the fifth picture.

Correspondingly, a fourth picture can be received, decoded, digitized and stored separately from the second picture, without overwriting the same. A sixth picture can be stored
15 at the same place as the second picture and overwrite the same while the fourth picture is projected.

With such a division and cyclic use of first and second digital storage devices, great tolerance in respect of the picture rate in incoming picture signal is achieved. This is a great advantage when the picture signals are transferred
20 through a data network where the transfer speed may vary greatly, and where picture data may get lost.

The picture from one projector is projected such that it can be viewed by one eye, and the picture from the other projector is projected such that it can be viewed by the
25 other eye. In a preferred arrangement, a picture from first and second projectors is projected in registry on a screen by means of polarized light, and the pictures are viewed through spectacles having polarized glass, such as explained.

By means of the invention is achieved that each and every
30 projected picture can be renewed in a cycle that only depends on the frequency with which the digital storage devices are scanned. Even if this may involve that the same picture is

shown several times if the incoming picture rate descends, a substantial reduction of flicker is obtained as compared with a known technique where picture projection follows the incoming picture rate.

- 5 A device for carrying out the described method is described in the following by means of two exemplary embodiments, and reference is made to attached drawings, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a simplified block scheme for a first
10 embodiment of the invention;

Figure 2 shows a simplified block scheme for a second embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In figure 1, the reference numeral 1 denotes a right
15 projector adapted to project a picture to be seen by the right eye, in registry with a projected picture from a corresponding, left projector 2 projecting a picture to be seen by the left eye.

Right projector 1 is coupled to and receives its picture
20 signal from a right picture generator 3. Left projector 2 is coupled correspondingly to a left picture generator 4. Each picture generator 3, 4 is adapted to scan a picture storage and generate a picture signal causing the projector 1, 2 belonging thereto, to project a visible picture belonging
25 thereto, on a screen.

Right picture generator 3 is adapted to scan periodically an area within a right picture storage 5, and left picture generator 4 is correspondingly adapted to scan periodically

an area within a left picture storage 6. Right picture storage 5 is divided into a first right picture area 7 and a second right picture area 8. Left picture storage 6 is correspondingly divided into a first left picture area 9 and
5 a second left picture area 10.

A right picture selector 11 is adapted to react on a control signal and connects, alternately, right picture generator 3 to first or second picture area 7, 8 in right picture storage 5 and, thus, determines if right projector 1 projects a
10 picture based on first or second picture area 7, 8. A left picture selector 12 is, correspondingly, adapted to react on a control signal, alternately connecting left picture generator 4 to first or second picture area 9, 10 in left picture storage 6, thus determining if left projector 2
15 projects a picture based on first or second picture area 9, 10.

A right decoder 13 is adapted to receive a picture signal and store values representing the picture signal, in right picture storage 5 on a format which right picture generator 3
20 is adapted to convert to picture signals for right projector 1. A left decoder 14 is, correspondingly, adapted to receive a picture signal and store values representing the picture signal, in left picture storage 6 on a format which left picture generator 4 is adapted to convert into picture
25 signals for left projector 2.

Between right decoder 13 and right picture storage 5, is disposed a right area selector 15 adapted to respond to a control signal, alternately connecting the decoder 13 to second or first picture area 8, 7 in right picture storage 5
30 and, thus, determine whether the decoder 13 stores values in second or first picture area 8, 7. Right picture selector 11 and right area selector 15 alternate such that right picture generator 3 and right decoder 13 are coupled to opposite picture area 7, 8 in right picture storage 5. Intermediate
35 left decoder 14 and left picture storage 6 is,

correspondingly, disposed a left area selector 16 adapted to respond to a control signal, alternately connecting the decoder 14 to second or first picture area 10, 9 in left picture storage 6 and, thus, determine whether the decoder 14 is storing values in second or first picture area 10, 9. Left picture selector 12 and left area selector 16 alternate such that left picture generator 4 and left decoder 14 are coupled to opposite picture area 9, 10 in left picture storage 6. A page selector 17 is adapted to respond to control signals and alternately connect a conductor 18 for an incoming picture signal to right decoder 13 or left decoder 14.

A controller 19 is adapted to sense the incoming picture signal and recognize signal values or signal codes defining a new picture and giving switching signals to the page selector 17 for each picture. Right decoder 13 is adapted to give a switching signal to right area selector 15 and right picture selector 11 each and every time the decoder has stored a new picture in right picture storage 5. Left decoder 14 is adapted to give a switching signal to left area selector 16 and left picture selector 12 each and every time the decoder has stored a new picture in right picture storage 6.

Each picture generator 3, 4 feeds a new picture, respectively, to right or left projector 1, 2, following a fixed picture rate, e.g. sixty times per second, even if the incoming picture rate varies. In lack of new picture information, the picture generators 3, 4 will repeat last picture.

The right picture selector may alternate while the right picture generator 3 is in the process of transferring picture signals to the projector 1. Advantageously, the picture generator 3 may be formed with internal storage, not shown, having a capacity for one picture, only scanning right picture storage 5 each time it has completed the transfer of one picture to right projector 1. Thus, a projected picture consisting of parts from two pictures is avoided.

Correspondingly, left picture selector 12 may come to alternate while left picture generator 4 is in the course of transferring picture signals to the projector 2.

Advantageously, the picture generator 4 may also be formed
5 with internal storage, not shown, having a capacity for one picture, only scanning left picture storage 6 each and every time it has completed to transfer a picture to left projector 2. Thus, a projected picture consisting of parts from two pictures is avoided.

10 A second and preferred embodiment of the invention is shown in figure 2, where the projectors 1, 2 are connected to a common picture storage 20 through a picture 11 selector and 12 of their own, respectively. Possible picture generator for each of the projectors 1, 2 is not shown, but it may be
15 disposed correspondingly to the described one. The picture storage 20 is divided into four picture areas 21, 22, 23, 24. A controller 25 is adapted to read and store a picture signal in the conductor 18 into one of the picture areas 21, 22, 23, 24 of picture storage 20 through an area selector 26.

20 Pictures are stored in consecutive succession, so that first picture is stored in picture area 21, the next in 22 and so forth until all picture areas have been used. The next picture is stored in 21, and the process repeats itself, the picture storage 20 being organized as a ring buffer.

25 Through its picture selector 11, projector 1 reads a picture stored in picture area 21 or 23. Through its picture selector 12, projector 2 reads a picture stored in picture area 22 or 24. Thus, each projector 1, 2 reads every second picture from the picture storage 20.

30 The alternating cycle for the picture selectors 11 and 12 is adjusted such that the gathered projected picture becomes as free of flicker as possible. The picture cycle at each projector 1, 2 may e.g. be equal to half of the cycle of the incoming pictures when it is lower than one predetermined
35 value and, thereupon, restricted to an upper picture cycle if

the incoming picture cycle increases beyond the same.
Typically, the incoming picture cycle should be lower than 85
pictures per second causing a corresponding outgoing picture
cycle. Above this limit, e.g. outgoing picture cycle may be
5 halved.

Likewise, the picture cycle to each projector 1, 2 can be
restricted to a minimum value, so that a stable picture is
maintained at an incoming picture signal which has an
extremely low cycle.

10 Accordingly, the present invention has been described with
some degree of particularity directed to the preferred
embodiments of the present invention. It should be
appreciated, though, that the present invention is defined by
the following claims construed in light of the prior art so
15 that modifications or changes may be made to the preferred
embodiments of the present invention without departing from
the inventive concepts contained herein.